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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,053	01/18/2002	Santosh C. Lolayekar	MARA-01008US0 SBS	1750

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EXAMINER

EDELMAN, BRADLEY E

ART UNIT	PAPER NUMBER
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2153

DATE MAILED: 07/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,053

Applicant(s)

LOLAYEKAR ET AL.

Examiner

Bradley Edelman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This action is a first office action on the merits of this case. Claims 1-26 are presented for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-6, 8-11, and 19-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Chauhan (U.S. Patent No. 6,115,752).

In considering claim 1, Chauhan discloses a method for use in a system for storing and accessing data, the system including at least one initiator ("user 400") and at least one target ("LNS") and at least one switch ("ONS") (col. 7, lines 8-11), comprising:

Providing a plurality of paths to the target from the initiator, each path passing through the switch; and dynamically load balancing among the paths by the switch (col. 7, lines 25-50, wherein path selection to the target constitutes load balancing).

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In considering claim 2, Chauhan further discloses determining a respective average response time ("round trip time") for each path, and passing a request received by the switch from the initiator to the target along the path with the shortest average response time (col. 7, lines 6-17, 27-42).

In considering claim 3, Chauhan further discloses that the target is a physical storage device ("local name server").

In considering claim 4, Chauhan further discloses that the target is a virtual target (the software receiving the communication is a "virtual" target).

In considering claim 5, Chauhan further discloses that the target is a mirrored target ("mirrored sites") with a plurality of members and wherein load balancing among the paths includes:

Determining a respective average response time ("round trip time") of each member of the mirrored target (col. 7, lines 27-30); and

Passing a request received by the switch from the initiator to the target to the member with the shortest average response time (col. 7, lines 6-17, 38-42).

In considering claim 6, Chauhan further discloses that the request is a read request (col. 7, lines 6-8, wherein the request is for an address).

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In considering claims 8, 19, and 23, Chauhan discloses a method for use in a storage network, a storage network, and a machine readable medium for carrying out the method, including at least one initiator ("user 400") and at least one storage device ("LNS") and at least one switch ("ONS") (col. 7, lines 8-11), comprising:

Providing a plurality of paths from the storage device to the initiator, determining a respective average response time for each path, and passing a request received by the switch from the initiator to the storage device along the path with the shortest average response time (col. 7, lines 25-50).

In considering claim 9, Chauhan discloses a method for use in a storage network, including at least one initiator ("user 400"), a mirrored virtual target having a plurality of members ("mirrored servers 406a-406b," wherein the software running the server program is a virtual server), and a switch ("ONS") (col. 7, lines 8-11), comprising:

Providing a plurality of paths from each member of the mirrored virtual target to the initiator, each path passing through the switch, determining a respective average response time for each path, and passing a request received by the switch from the initiator to the member with the shortest average response time (col. 7, lines 25-50).

In considering claim 10, Chauhan further discloses that the request is a read request (col. 7, lines 6-8, wherein the request is for an address).

In considering claim 11, claim 11 presents the same limitations as claim 8, but further describes that selection method applies to two separate initiators making two separate requests. Chauhan further discloses such a feature (i.e. the DNS system is inherently used by a plurality of users).

In considering claims 20 and 24, Chauhan further discloses that the target is a physical storage device ("local name server").

In considering claim 21 and 25, Chauhan further discloses that the target is a virtual target (the software receiving the communication is a "virtual" target).

In considering claim 22, Chauhan further discloses that the target is a mirrored target ("mirrored sites") with a plurality of members and wherein the plurality of paths are respective paths to each member (col. 7, lines 38-42).

In considering claim 26, Chauhan further discloses that the target is a mirrored target ("mirrored sites") with a plurality of members and wherein load balancing among the paths includes:

Determining a respective average response time ("round trip time") of each member of the mirrored target (col. 7, lines 27-30); and

Passing a request received by the switch from the initiator to the target to the member with the shortest average response time (col. 7, lines 6-17, 38-42).

2. Claims 1-6, 8-11, and 19-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Jindal et al. (U.S. Patent No. 6,324,580, hereinafter "Jindal").

In considering claim 1, Jindal discloses a method for use in a system for storing and accessing data, the system including at least one initiator ("client") and at least one target ("server") and at least one switch ("nameserver") (col. 5, lines 26-33), comprising:

Providing a plurality of paths to the target from the initiator, each path passing through the switch; and dynamically load balancing among the paths by the switch (col. 5, lines 50-51, 57-59; col. 6, lines 37-40; col. 7, lines 14-16, wherein the replicated server is selected based on the response time, which is dynamically updated at the switch according to present load).

In considering claim 2, Jindal further discloses determining a respective average response time ("response time") for each path, and passing a request received by the switch from the initiator to the target along the path with the shortest average response time (col. 6, lines 37-40; col. 7, lines 58-61, "the preferred server may, for example, be the one having the fastest response time (and which is thus likely to be the least-loaded server)").

In considering claim 3, Jindal further discloses that the target is a physical storage device ("server").

In considering claim 4, Jindal further discloses that the target is a virtual target (the server software receiving the communication is a "virtual" target).

In considering claim 5, Jindal further discloses that the target is a mirrored target ("replicated service") with a plurality of members ("servers") and wherein load balancing among the paths includes:

Determining a respective average response time ("response time") of each member of the mirrored target, and passing a request received by the switch from the initiator to the target to the member with the shortest average response time (col. 7, lines 56-61).

In considering claim 6, Jindal further discloses that the request is a read request (col. 5, lines 50-51, wherein the request is to access information on the server).

In considering claims 8, 19, and 23, Jindal discloses a method for use in a storage network, a storage network, and a machine readable medium for carrying out the method, including at least one initiator ("client") and at least one storage device ("server") and at least one switch ("nameserver") (col. 5, lines 26-33), comprising:

Providing a plurality of paths from the storage device to the initiator, determining a respective average response time for each path, and passing a request received by the switch from the initiator to the storage device along the path with the shortest average response time (col. 5, lines 50-51, 57-59; col. 6, lines 37-40; col. 7, lines 14-16,

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wherein the replicated server is selected based on the response time, which is dynamically updated at the switch according to present load).

In considering claim 9, Jindal discloses a method for use in a storage network, including at least one initiator ("client"), a mirrored virtual target ("virtual server") having a plurality of members ("replicated service on server 110, 112, and 114"), and a switch ("nameserver") (col. 5, lines 26-33), comprising:

Providing a plurality of paths from each member of the mirrored virtual target to the initiator, each path passing through the switch, determining a respective average response time for each path, and passing a request received by the switch from the initiator to the member with the shortest average response time (col. 5, lines 50-51, 57-59; col. 6, lines 37-40; col. 7, lines 14-16, wherein the replicated server is selected based on the response time, which is dynamically updated at the switch according to present load).

In considering claim 10, Jindal further discloses that the request is a read request (col. 5, lines 50-51, wherein the request is to access information on the server).

In considering claim 11, claim 11 presents the same limitations as claim 8, but further describes that selection method applies to two separate initiators making two separate requests. Jindal further discloses such a feature (i.e. the server system is inherently used by a plurality of clients).

In considering claims 20 and 24, Jindal further discloses that the target is a physical storage device ("server").

In considering claim 21 and 25, Jindal further discloses that the target is a virtual target (col. 5, line 30, "virtual server").

In considering claim 22, Jindal further discloses that the target is a mirrored target ("replica service") with a plurality of members ("servers") and wherein the plurality of paths are respective paths to each member (col. 5, lines 30-33).

In considering claim 26, Jindal further discloses that the target is a mirrored target ("replicated service") with a plurality of members ("servers") and wherein load balancing among the paths includes:

Determining a respective average response time ("response time") of each member of the mirrored target, and passing a request received by the switch from the initiator to the target to the member with the shortest average response time (col. 5, lines 50-51, 57-59; col. 6, lines 37-40; col. 7, lines 14-16, wherein the replicated server is selected based on the response time, which is dynamically updated at the switch according to present load).

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3. Claims 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Masuda et al. (U.S. Patent No. 6,201,810, hereinafter "Masuda").

In considering claim 15, Masuda discloses a switch ("path candidate selection unit") for use in a storage network, comprising:

A plurality of ports ("ports"), and load balancing circuitry ("congestion status monitor unit 14") affiliated with each of the ports (col. 5, lines 13-36, 52-54).

In considering claim 16, Masuda further discloses that the load balancing circuitry includes a storage processor and a CPU (inherent, since it includes a Routing Table and it processes information - see Fig. 1).

In considering claim 17, Masuda discloses a switch ("path candidate selection unit") for use in a storage network, the network including an initiator ("A station") and a target ("J station") in communication with the initiator by a plurality of paths, each path passing through the switch (col. 6, lines 57-67), the switch comprising:

A plurality of ports ("ports," col. 5, lines 52-54); and

Means for load balancing among the paths (col. 5, lines 18-34, wherein path selection constitutes load balancing).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chauhan, or alternatively Jindal, in view of Masuda.

In considering claim 7, although the systems taught by both Chauhan and Jindal disclose substantial features of the claimed invention, they fail to disclose that the switch includes a plurality of ports and wherein load balancing is performed by respective circuitry affiliated with each respective port. Nonetheless, the use of multiple ports to connect a switch to multiple servers in a load balancing system is well known, as evidenced by Masuda. In a similar art, Masuda discloses a system for selecting between paths when connecting an initiator to a target device, wherein the switch used to connect the devices has multiple ports, each port connecting to a different member of the target device (Fig. 1, col. 5, lines 25-35, 51-54). Thus, given the teaching of Masuda, it would have been obvious to a person having ordinary skill in the art to include the multiple ports taught by Masuda in either one of the systems taught by Chauhan or Jindal, to provide for faster path selection.

In considering claims 12-14, although the combined system taught by Chauhan, or alternatively Jindal, and Masuda teaches selecting paths connected to particular ports according to path characteristics, it fails to discuss the use of linecards associated with the ports and/or the paths, and for passing the requests to the path. Nonetheless, Examiner takes official notice that the use of linecards in a switch to process requests is

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well known. Thus, it would have been obvious to use linecards in the switch taught by the combined system of Chauhan, or alternatively Jindal, and Masuda, because hardware devices provide for faster processing than software products.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda, in view of Chauhan, or alternatively in view of Jindal.

In considering claim 18, Masuda discloses means for maintaining statistics for each path, and for selecting the path according to those statistics (col. 8, lines 36-45, "congestion status"). However, Masuda does not disclose that the statistics include response time for each path. Nonetheless, as discussed above, basing path selection to a target according to response time is well known (see Chauhan, col. 7, lines 27-30; Jindal, col. 7, lines 56-61). Therefore, it would have been obvious to a person having ordinary skill in the art to use base the path selection taught by Masuda on response time, as taught by Chauhan and Jindal, to minimize the delay associated with the response.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley Edelman whose telephone number is (703) 306-

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3041. The examiner can normally be reached on Monday to Friday from 8:30 AM to 5:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glen Burgess can be reached on (703) 305-4792. The fax phone numbers for the organization where this application or proceeding is assigned are as follows:

For all After Final papers: (703) 746-7238.

For all other correspondences: (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

BE
July 15, 2003



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